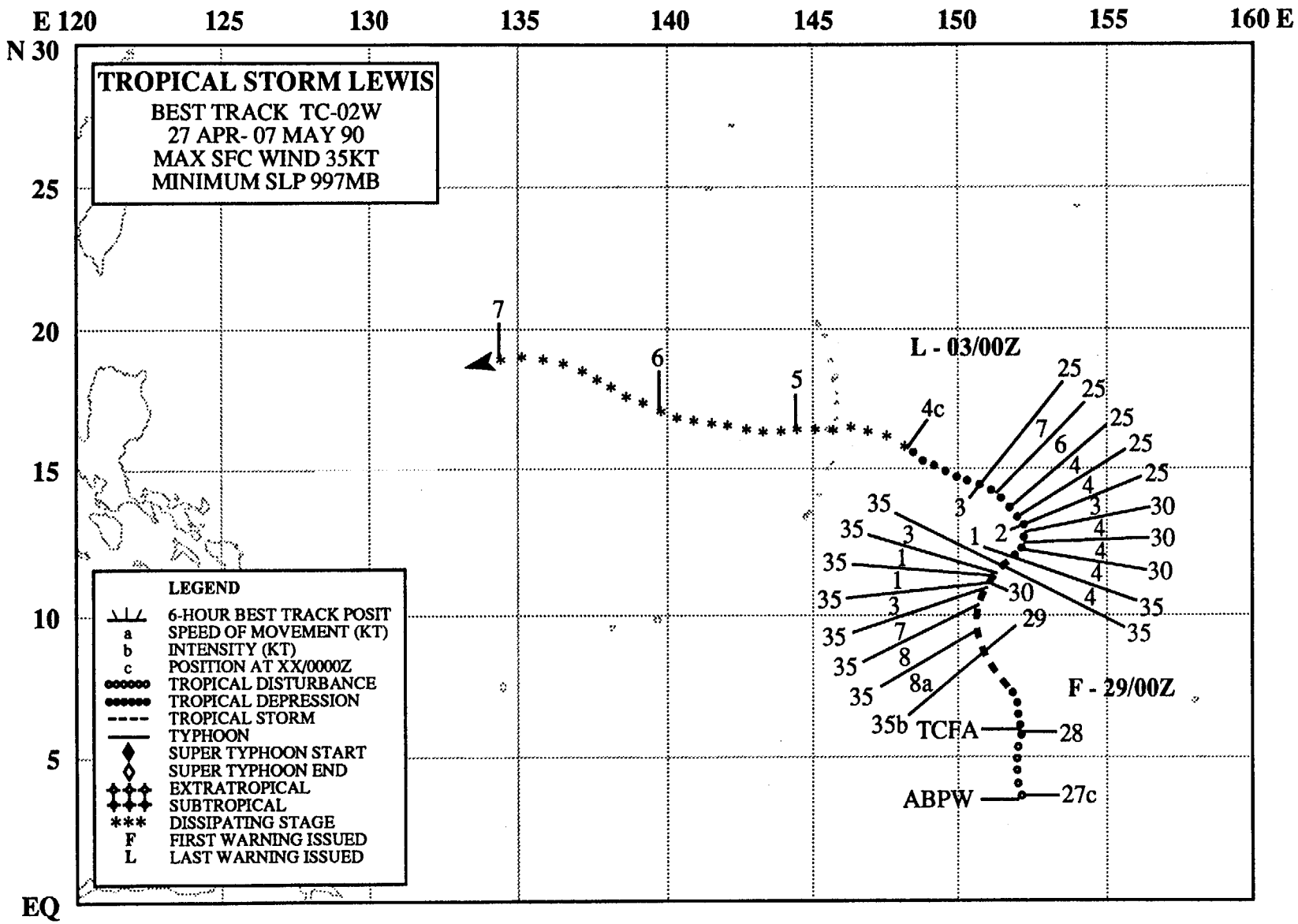
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EQ
TROPICAL STORM LEWIS
BEST TRACK TC-02W
27 APR- 07 MAY 90
MAX SFC WIND 35KT
MINIMUM SLP 997MB
LEGEND
6-HOUR BEST TRACK POSIT
a SPEED OF MOVEMENT (KT)
b INTENSITY (KT)
c POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
SUBTROPICAL
*** DISSIPATING STAGE
F FIRST WARNING ISSUED
L LAST WARNING ISSUED
L - 03/00Z
F - 29/00Z
TCFA
ABPW
4c
35b
8a
27c
28
29
30

TROPICAL STORM LEWIS (02W)

I. HIGHLIGHTS

Lewis ended the two and a half month lull in northern hemisphere tropical cyclone activity that followed Typhoon Koryn (01W) in January. Developing from a tropical disturbance 200 nm south of Chuuk in the central Caroline Islands, Lewis passed directly over Chuuk while still a tropical depression and continued a northward trek for four more days. After being sheared apart by a digging midlatitude trough, the low-level remnants of the tropical cyclone drifted west-northwestward for several more days before completely dissipating.

II. CHRONOLOGY OF EVENTS

262330Z - The Significant Tropical Weather Advisory was reissued to address the redevelopment of an area of persistent convection with an estimated minimum sea-level pressure of 1009 mb.

280300Z - Tropical Cyclone Formation Alert based on increased convection, organization, and outflow aloft.

290000Z - First warning due to continued improvement in organization of the convection. Initial intensity based on synoptic data vice Dvorak intensity which had been CI 2.5 for approximately six hours.

290600Z - Upgrade to tropical storm prompted by improved upper-level organization. Peak intensity never exceeded 35 knots.

011800Z - Downgrade to tropical depression based on visual satellite imagery which showed partially exposed low-level.

030000Z - Final warning - dissipating over water - due to fully exposed low-level circulation.

III. TRACK AND MOTION

During initial development, Lewis tracked northward due to southerly flow associated with a mid-level anticyclone over the Marshall Islands. The anticyclone was separate from the subtropical ridge that was located near 20°north lattitude. The initial northward motion changed to northwestward at 281200Z (Figure 3-02-1). This synoptic adjustment resulted in Lewis passing directly over Chuuk. As a midlatitude trough began to dig to the northwest of Lewis, the steering flow veered from southeasterly to southwesterly (Figure 3-02-2) and caused the tropical cyclone to begin recurving at

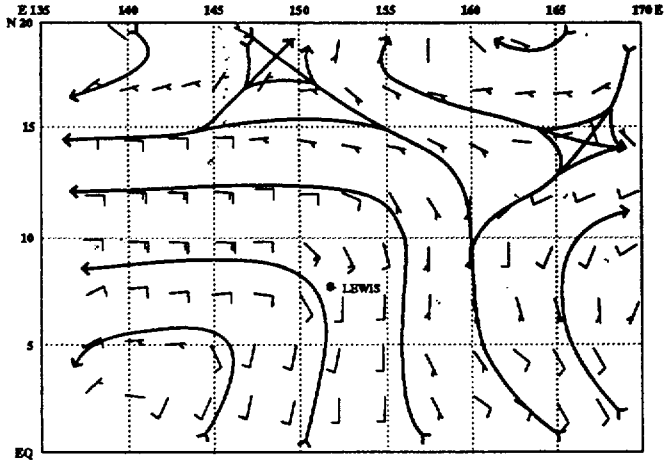

Figure 3-02-1. Lewis' turn to the northwest appears related to the subtle change of the steering flow from south to southeast on the 281200Z deep layer mean analysis.

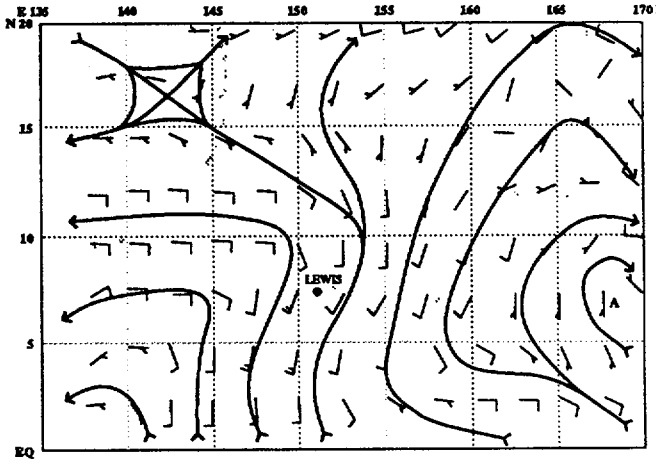

Figure 3-02-2. The 290000Z deep layer mean analysis shows the weakening of the ridge north-northeast of Lewis and maintenance of the anticyclonic circulation east of the tropical cyclone. This synoptic change, plus Lewis' continued movement to the north, brought Lewis into an area of light southwesterly steering flow.

291200Z. However, by 300000Z, the upper-level trough dug so far equatorward (to 10° north latitude) that the top of Lewis was sheared off by stronger westerlies aloft. Although Lewis' central convective activity intermittently flared up, the low-level circulation became exposed at 020000Z, and the low-level remnants of the cyclonic circulation drifted west-northwestward in response to the steering flow under the 850-mb ridge.

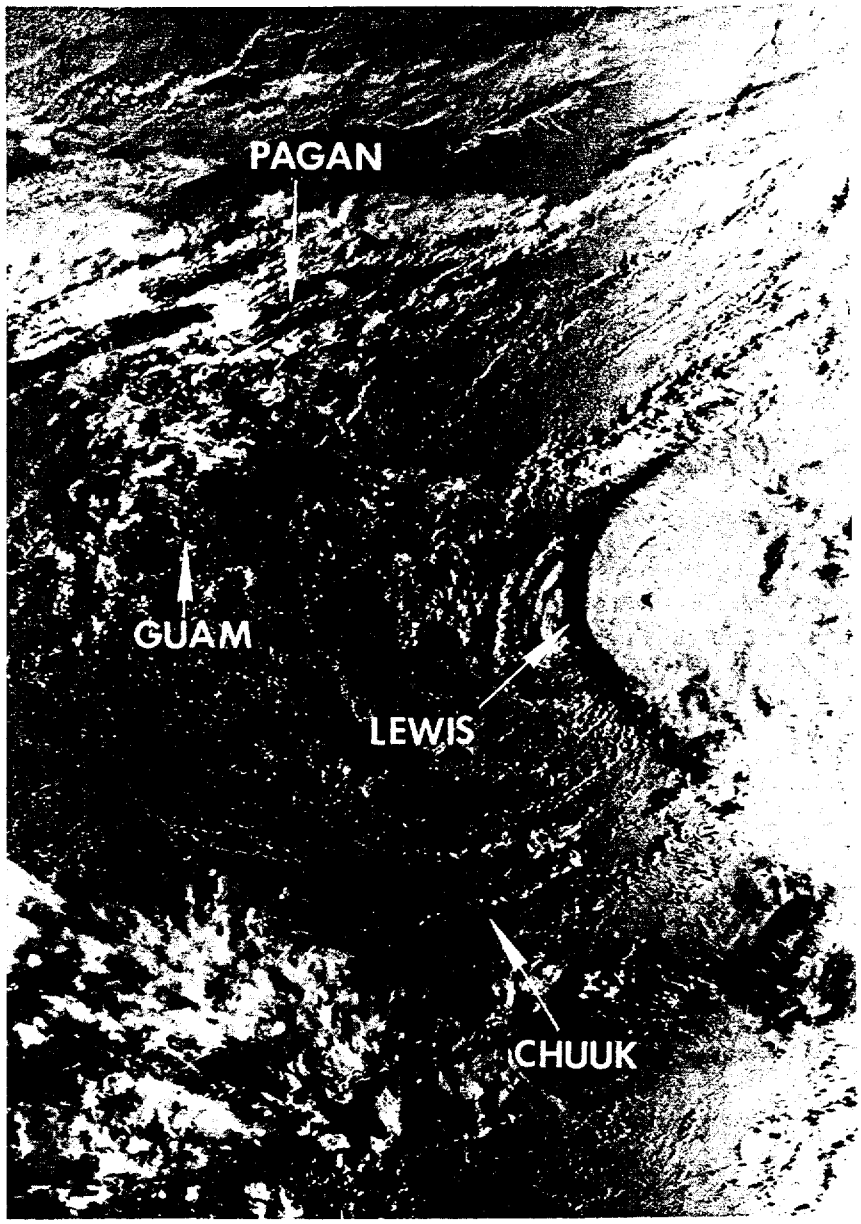

Figure 3-02-3. The sheared condition of Lewis (02W) is strikingly emphasized by the low sun-angle (012022Z May DMSP visual imagery).

IV. INTENSITY

In the early stages of its development, Lewis exhibited sufficient outflow to support moderate development. However, after reaching minimal tropical storm intensity, Lewis' further development was arrested by the encroaching 200-mb westerlies associated with the digging midlatitude trough (Figure 3-02-3). Two days later, the system began to slowly dissipate.

V. FORECASTING PERFORMANCE

Figure 3-02-4 shows the JTWC forecast performance for Lewis. Although the early forecasts anticipated the track change to the northwest followed by a change to the northeast, the forecasts were slow to anticipate the recurving effect of the digging midlatitude trough. Since neither subjective guidance nor the objective forecast aids available to JTWC were able to precisely address a shear-induced decoupling of the low-level circulation from its upper-level, the official forecasts incorrectly presumed continued recurvature. However, as early as 300600Z forecasters included an alternate scenario of shear-induced decoupling followed by west-northwestward movement of the low-level circulation in the prognostic reasoning.

VI. IMPACT

No information received.

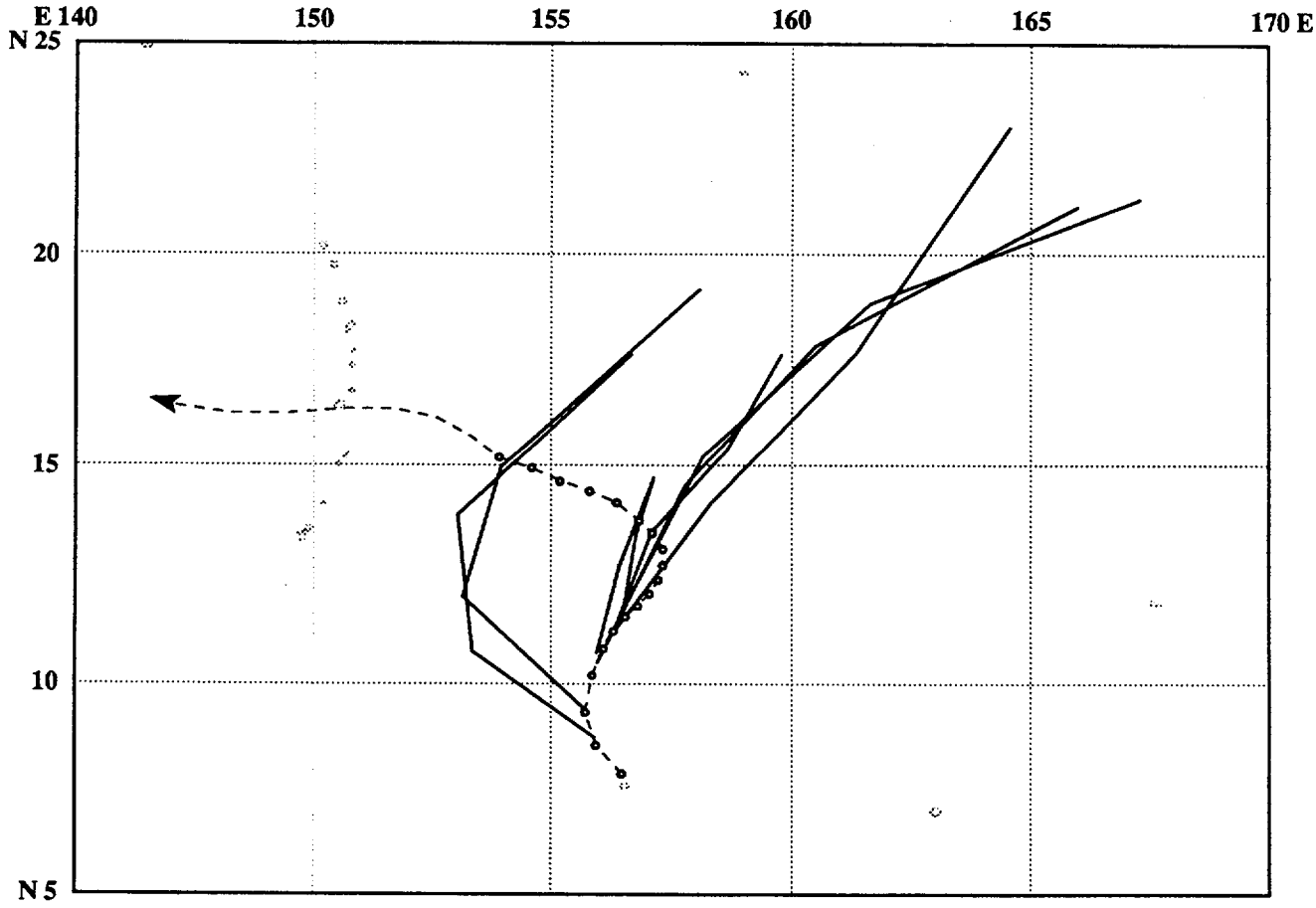

Figure 3-02-4. Summary of JTWC forecasts (solid lines) for Lewis (02W) superimposed on the final best track (dashed line).